

**REMARKS**

Claims are now in this application. Claims 5 - 7, and 10 - 11 are rejected. Claims 1 - 5, and 8 - 9 are cancelled herein. Claims 1 - 4, and 8 - 9 were withdrawn as being drawn to a non-elected invention. Claim 5 is cancelled on other grounds. All cancellations of claims are done without prejudice. New claims 12 - 38 are added. Claims 6 - 7, and 10 - 11 are amended herein to express the invention in alternative wording, and to address matters of form unrelated to substantive patentability issues, including amending the number(s) of the claim(s) upon which they depend. Other formal matters are attended to that were not addressed by the Examiner and accordingly are considered unrelated to substantive patentability issues. New claims 12 - 38 are added to more particularly point out and precisely claim the subject matter which the applicant regards as the invention. Claim 12 is the new main independent claim, replacing cancelled independent claim 5. All other claims in the application are dependent claims which depend directly or indirectly from new claim 12. The new and amended claims are believed to be written in more colloquial English.

No new matter is introduced into the claims by any of the amendments thereto or by the new claims that have been added. Support for all amendments to the claims and new claims is found in the original specification and drawing

figures.

Applicant submits herewith a substitute specification and abstract wherein amendments are effected to place the text thereof into proper English in accordance with 37 CFR 1.125(c). Also accompanying this amendment is a reproduction of the original specification and abstract with markings indicating the amendments effected in the substitute specification in accordance with MPEP §608.01(q) and 37 CFR 1.125(b). No new matter is added. Entry of the substitute specification and abstract is respectfully requested.

In the Office Action, claim 11 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. In particular, the Examiner indicated that the term "protrusions" was unclear and indefinite because that term had previously been used in claim 5, and it was unclear whether the reference was to the same or different protrusions.

It is respectfully submitted that the foregoing basis for rejection is rendered moot by the amendments to the claims made hereinabove.

In the Office Action, claims 5 - 7 and 10 - 11 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,753,021 to Cohen ("Cohen").

It is respectfully submitted that the foregoing rejection under 35 U.S.C. 102(b) is rendered moot by the amendments to the claims made herein above and by the new claims added herein above.

Cohen does not teach, disclose, or suggest a shoe outer sole having the elements and features of the shoe outer sole of the present invention, as taught in the present application and as claimed according to the amended and new claims pending in the present application after entry of this Amendment.

In particular, with regard to the marked-up version of the drawing figure of Cohen which the Examiner supplied with the Office Action, wherein the Examiner purports to show that the shoe outer sole of Cohen includes “vertical supports” and “erect protrusions”, it is respectfully submitted that the “vertical supports” of applicant’s invention are different in that they are positioned inside the through holes; and the “erect protrusions” in Cohen are not protrusions, but rather are connecting members, which do not extend into the volume of the through holes, but rather are adjacent to and alternating with the through holes, and completely connect the structure above and below the spaces. Applicant’s erect protrusions do not extent all the way to the upper part of the volume of the through holes.

Accordingly, it is respectfully requested that the rejection based on Cohen be withdrawn after entry of this Amendment and that the rejection not be

applied to any of the claims against which it was originally applied after amendment of those claims thereof still remaining in the application, or to any of the claims in the application newly added by this Amendment.

The claims pending in the present application after entry of this Amendment include a total of 31 claims, including one independent claim and 30 dependent claims. A net number of 11 total claim(s) in excess of twenty previously paid for are added. There is no net addition of independent claims. Accordingly, please charge the fee of  $11 \times \$9 = \$99$  to Deposit Account No. 10-1250. Applicant has Small Entity status.

Applicant respectfully requests a three month extension of time for responding to the Office Action. Please charge the fee of \$475.00 for the extension of time to Deposit Account No. 10-1250. Applicant has Small Entity status.

A Request for Continued Examination application transmittal is also being filed herewith. Authorization to charge the filing fee therefor is made separately therein.

No other charges are believed due with the filing of this Amendment. If, however, any additional fees should be due, they should be charged to Deposit Account No. 10-1250. Any overpayments should be credited to that account.

In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited. .

This Amendment, as well as the accompanying Request for Continued Examination application transmittal have been prepared and are being filed by applicant's new attorneys, the undersigned Jordan and Hamburg, LLP.

Applicant has revoked the prior Power of Attorney to Whitham, Curtis and Christofferson, P.C. A new Power of Attorney has been sent to applicant for execution, but was not received in time to be filed with these papers. The newly executed Power of Attorney to Jordan and Hamburg, LLP will be submitted for filing with the USPTO as soon as it is received from applicant through his local attorney in South Korea.

Respectfully submitted,

JORDAN AND HAMBURG LLP

By C. Bruce Hamburg  
C. Bruce Hamburg  
Reg. No. 22,389  
Attorney for Applicant

By Howard R. Jaeger  
Howard R. Jaeger  
Reg. No. 31,376  
Attorney for Applicant

Jordan and Hamburg LLP  
122 East 42nd Street  
New York, New York 10168  
(212) 986-2340

enc: Substitute Specification; and Marked reproduction of original  
specification; transmittal of Request for Continued Examination  
application.



MARKED SPECIFICATION

Ser. No. 09/582,670

~~The outsole~~ OUTER SOLE OF SHOE[[, its manufacturing]] METHOD[[, and its  
molding]] OF ITS MANUFACTURE, AND MOLD THEREFOR

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BACKGROUND OF THE INVENTION

Field of the Invention

5     [00001]       The present invention relates to the ~~outsole~~ outer soles of sports  
shoes, ~~wherein the throughout~~ having through - holes passing through a lateral  
surface ~~are formed of the sole, their manufacturing a method for their~~  
manufacture, and an apparatus for their molding[[, and, more]] , More  
particularly, the present invention relates to the ~~outsole~~ outer sole of sports shoes  
10    ~~wherein the throughout holes passing through a lateral surface are formed, their~~  
~~manufacturing method, and their molding, so that, by forming the~~ through holes  
so as to ~~be~~ extend through a lateral surface in the side direction of the midsole, as  
well as by reducing the weight of ~~sports~~ the shoes, it is ~~intended~~ possible not only  
to increase the ~~cushion~~ cushioning effect of the shoes, without using air ~~bags~~  
15    cushions, but also to have a ~~good~~ the desirable effect ~~keeping warm of insulating~~  
the wearer's feet, since the ~~throughout~~ through - holes ~~are separated~~ serve to  
separate the foot from the ground ~~after wearing the sports~~ while the shoes are  
being worn.

Discussion of Related Art

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**[00002]** It is well-known that ~~since in the~~ it is desirable to make conventional ~~outsole~~ outer soles of sports shoes[[, the weight of becomes light]] lightweight and, in order to make ~~the them~~ comfortable ~~cushion~~ and provide a cushioning effect, an air ~~bag~~ cushion is used in the ~~case of manufacturing~~ manufacture of the midsole of the shoe. in the case of In manufacturing it such outer soles, however, it additional work is necessarily required ~~to work~~ in order to ~~fix~~ provide an additional air ~~bag~~ cushion on the ~~molding~~ mold in which a midsole is formed, and also since these air ~~bags use the one that is manufactured as an~~ cushions require additional work ~~at the state that~~ prior to assembly of the soles to inflate the cushions with air or gas ~~is inserted~~, it has caused ~~the an~~ increase of the manufacturing cost as well as an increase in the defective rate of goods and it has a drawback in that it ~~will lose the~~ the shoes lose their function as sport shoes ~~in case that~~ if the air bag cushion is exploded deflates after wearing it, ~~and etc~~ the shoes.

**[00003]** Currently, as a way of manufacturing the midsole in the ~~outsole~~ outer sole of sports shoes, it has been used that since it is formed at the state that the midsole is placed horizontally, it is molded in a shooting method normally by raising it onto upside and inserting resin, which is used to be shot, to the mold of molding consisting of the 2nd or 3rd stage and heating it up to a fixed temperature.



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[00004] Accordingly, ~~as~~ a structure of a molding mold for the manufacture of shoe outer soles, as ~~normally~~ shown in FIG. 9, it has been used as a way of manufacturing the ~~outsole~~ outer sole of sports shoes that the middle stage molding mold 200, which is ~~amassed continuously~~ positioned adjacently upwardly from the lower stage molding mold 100 and the higher stage molding mold 300 in which a protrusion 600 is formed, are raised sequentially upwardly.

[00005] Also, in order to increase the cushioning force as well as to reduce the weight of shoes today, ~~normally~~ as shown in FIG. 9, ~~the~~ molding operation is performed ~~in a shooting way~~ by injection molding, wherein forming a protruding pin 400 is formed so that an air ~~bag~~ cushion may be ~~fixed~~ placed in the side partition of the molding mold and then ~~fixing~~ attaching the air ~~bag~~ cushion by inserting an air ~~bag~~ cushion between the side partition of the molding mold and a protruding pin 400, or an air ~~bag~~ cushion is mounted on the midsole, which is molded, by mounting the air ~~bag~~ cushion into ~~the~~ an inserting tube 500 ~~by forming~~ the inserting tube 500 which is first formed.

[00006] ~~However there~~ There is, however, a drawback in that, since additional air or gases are not inserted into an air ~~bag~~ cushion, ~~and~~ in the case that the air bags cushion is ~~exploded~~ deflated, the ~~cushion~~ cushioning function of the shoes is probably significantly reduced.

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**[00007]** Another drawback is that these kinds of air ~~bags~~ cushions are costly and expensive due to the cost increase since the air ~~bags~~ cushions ~~should~~ must be ~~made~~ specially made for this purpose.

5 SUMMARY OF THE INVENTION

**[00008]** Accordingly, in order to overcome such drawbacks in the conventional art, it is therefore an object of the present invention to provide ~~the~~ outsole of an outer sole for sports shoes, in which ~~the~~ throughout through - holes, which ~~are passed~~ pass through a lateral surface, are formed on ~~the~~ a lateral surface of the midsole of ~~the~~ sports shoes, which ~~are constituted with~~ have an outsole , or bottom sole, and a midsole, so that ~~its~~ the weight of the shoe is reduced and its ~~cushion~~ cushioning effect is increased by the throughout through - holes, ~~which are passed through a lateral surface~~, and the cushioning ~~force~~ effect is ~~protected~~ as the maintained by a partition, which is created between ~~the~~ throughout adjacent through - holes, and which plays a roll as ~~the~~ a reinforcing support.

**[00009]** It is another object of the present invention to provide a midsole ~~of~~ for sports shoes, in which the ~~throughout~~ through - holes are formed ~~on in~~ in the lateral direction of the midsole ~~simply~~ by bisecting the midsole at the ~~state~~ location that the ~~molding~~ midsole mold is erected on a lateral surface, molding the

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respective ~~one~~ midsole pieces, glueing them together, and then glueing the upper midsole thereto in order to form the ~~throughout~~ through - holes.

**[00010]** It is another object of the present invention to provide a manufacturing method in which the midsole is formed integrally and

5 monolithically in a way that even where the manufacturing ~~molding mold for the~~ lower part of the midsole is ~~formed into~~ made in two ~~stages parts~~, the lower stage ~~molding is divided into~~ including a fixed molding mold piece and an ~~operational~~ molding a movable mold piece, ~~and such that~~ only the ~~operational molding of~~ movable mold for of a side of the lower midsole can be separated in order to

10 manufacture the midsole integrally, wherein the ~~throughout~~ through - holes are formed in the lateral direction by not molding at the ~~state~~ location that the midsole is erected but molding at ~~the~~ a horizontal state location.

**[00011]** It is another object of the present invention to provide a manufacturing method which can be ~~manufactured~~ implemented without a

15 ~~coupling creating a seam line on the outer sole~~, by ~~lifting up at~~ raising the mold at the ~~state that~~ location where only middle stage molding mold, ~~among of a~~ three stage ~~molding which are~~ manufacturing molding mold, is ~~being~~ divided into ~~the~~ a right and left side, in order not to form the coupling seam lines or in order to form the coupling lines on the midsole, in which the ~~throughout~~ through - holes are

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formed because the fixed ~~molding mold~~ is separated from the ~~operational molding~~  
movable mold in the midsole thus formed ~~as these~~.

[00012] It is another object of the present invention to provide ~~the a~~  
midsole ~~of for~~ sports shoes, in which ~~the an~~ elastic bar or ~~the an~~ elastic tube,  
5 which is made of flexible material and has a good elastic ~~force~~ properties in order  
to increase a cushion-maintaining ~~force~~ ability of the ~~throughout through -~~ holes,  
so that the restoring force of the ~~throughout through -~~ holes ~~may be~~ is reinforced  
supplemented, is formed on the front or the back of the ~~throughout through -~~  
holes.

10 [00013] It is another object of the present invention to provide ~~the a~~  
midsole ~~of for~~ sports shoes, in which the shapes of the ~~throughout through -~~ holes  
~~are diversified due to these molding~~ can be made differently according to the  
shape of the dies for making the through-holes on the molds, so that a variety of  
designs can be made ~~while~~ with each having a different cushioning ~~force~~ effect.

15 [00014] It is another object of the present invention to provide ~~the a~~  
midsole ~~of for~~ sports shoes, in which a filler or a reinforcing tube for a stopper is  
formed in ~~these~~ the ~~throughout through -~~ holes, so that the elastic force can be  
protected.

[00015] It is another object to provide a ~~molding mold~~ which can  
20 manufacture midsoles 22 integrally, as a single monolithic piece.

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**[00016]** To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, there is provided a method of manufacturing the ~~outsole~~ outer sole of sports shoes, in which the ~~throughout~~ through - holes are formed, comprising the steps of forming  
5 the midsole so as to be cut and bisected, joining the cut surface after this, and joining the midsole by covering the entire lower surface of the midsole after this.

**[00017]** According to another aspect of the present invention, there is also provided the ~~outsole~~ outer sole of a shoe, in which the ~~throughout~~ through - holes are passing through the front edge and the back edge in the side direction of  
10 midsole formed in a shooting ~~molding~~ mold.

**[00018]** According to another aspect of the present invention, there is also provided a ~~molding~~ mold for forming of the midsole, wherein the ~~molding~~ comprises mold includes three widely known and disclosed stage ~~molding~~ molds, the ~~molding~~ molds comprising a lower stage ~~molding~~ mold 12, in which the  
15 ~~throughout~~ through - hole protrusion 15 is fixed in two columns, a middle stage ~~molding~~ mold 11, in which the ~~throughout~~ through - holes 15 that is formed in two columns by forming two sheds, or cavities 18, divided by a separating partition 13 are inclined toward the separating partition 13 of the respective shed 18, and a higher stage ~~molding~~ mold 10, in which a ~~molding~~ mold protrusion 14  
20 that is inserted through the sheds 18 of the middle ~~molding~~ mold 11 so as to be

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placed in parts, where the respective ~~throughout~~ through - hole protrusion 15 formed on the middle ~~molding~~ mold 12 is not formed.

BRIEF DESCRIPTION OF THE ATTACHED DRAWINGS

**[00019]** A more complete ~~appreciation~~ understanding of the invention, and  
5 many of the attendant advantages thereof, will be readily apparent ~~as the same~~  
~~becomes better understood~~ by reference to the following detailed description when  
considered in conjunction with the accompanying drawings in which like  
reference symbols represent the same or similar components, wherein:

FIG. 1 is a perspective view showing the manufacturing steps of the  
10 ~~outsole~~ outer sole of ~~the a sports shoes~~ shoe;

FIG. 2 is a perspective view of ~~an example of molding~~ a mold for forming  
the midsole shown in the first step of FIG. 1;

FIG. 3 is a perspective view showing ~~the configuration state of~~ another  
~~molding~~ mold for forming the midsole;

15 FIG. 4 is a perspective view showing the ~~configuration state of yet~~ another  
~~molding~~ mold, in which a fixed ~~molding~~ mold and a ~~operational~~ molding  
moveable mold are closed;

FIG. 5 is a perspective view of ~~the appearance showing the state, in which~~  
the ~~molding~~ mold of FIG. 3 is ~~combined in order~~ closed to form the midsole;

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FIG. 6 is a perspective view showing ~~the state, in which~~ a fixed molding mold and ~~an operational molding~~ a moveable mold are opened so as to indicate that an air ~~bag~~ cushion can be mounted on the front edge of the molding mold shown in FIG. 3;

5        FIG. 7 is a perspective view showing the configuration state of another molding mold for forming the midsole;

FIG. 8 is a perspective view showing the state, in which the middle stage molding mold of FIG. 7 is lifted;

10       FIG. 9 is a perspective view showing the structure of the molding mold, in which a conventional midsole is formed;

FIG. 10 is a cross sectional view of the ~~state, in which the throughout~~ through - holes of the midsole ~~are formed to be slanted on a slant;~~

FIG. 11 is a cross sectional view of ~~the state, in which~~ a latticed support is ~~supported~~ in the ~~throughout~~ through - holes of the midsole;

15       FIG. 12 is a cross sectional view of ~~the state, in which~~ a three legged support ~~is formed~~ into the ~~throughout~~ through - holes of the midsole;

FIG. 13 is a cross sectional view of ~~the state, in which~~ a vertical support is formed into the ~~throughout~~ through - holes of the midsole;

20       FIG. 14 is a cross sectional view of ~~the state, in which the throughout~~ completely-formed through - holes of the midsole ~~are formed entirely;~~

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FIG. 15 is a cross sectional view of ~~the state, in which~~ a plurality of the ~~throughout through -~~ holes on the midsole ~~are formed into the essential input part~~ in a single main groove;

FIG. 16 is a cross sectional view of ~~the state, in which~~ a plurality of the ~~throughout through -~~ holes on the midsole ~~are formed into the essential input part~~ a single main groove, and are covered with ~~the~~ a stopper;

FIG. 17 is a cross sectional view of ~~the state, in which~~ the ~~throughout~~ ~~through -~~ holes of the midsole are formed into two ~~stories~~ levels;

FIG. 18 is a cross sectional view of ~~the state, in which~~ the ~~throughout~~ ~~through -~~ holes of the midsole ~~are formed into two stages so as to be zigzagged a~~ zigzag pattern;

FIG. 19 is a cross sectional view of ~~the state, in which~~ an air bag is cushion mounted upwardly into the ~~throughout through -~~ holes of the midsole.

FIG. 20 is a cross sectional view of ~~the state, in which~~ a curved elastic plate is mounted upwardly into the ~~throughout through -~~ holes of the midsole.

FIG. 21 is a perspective view of the ~~state, in which~~ the ~~throughout through~~ ~~-~~ holes of the midsole ~~are~~ passed completely through the front edge and the back edge ~~all;~~



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FIG. 22 is a cross sectional view of ~~the state, in which~~ a plurality of ~~fine erecting protrusion is~~ thin erect protrusions are formed into the ~~throughout~~ through - holes of the front edge on the midsole;

FIG. 23 is a perspective view of ~~the state, in which~~ the curved protrusion is formed into the ~~throughout~~ through - holes of the midsole;

FIG. 24 is a perspective view showing another shape of the curved protrusion;

FIG. 25 is a perspective view of ~~the state, in which~~ a supporting protrusion is formed on the ~~throughout~~ through - holes of the midsole;

FIG. 26 is a cross sectional view of ~~the state, in which~~ a ~~shed is formed~~ cavity formed, in which a lateral part of the ~~throughout~~ through - holes on the midsole is incised;

FIG. 27 is a cross sectional view of ~~the state, in which~~ a supporting structure is inserted ~~on in~~ the ~~shed~~ cavity;

FIG. 28 is a cross sectional view, in which another shape of the ~~shed~~ cavity is indicated;

FIG. 29 is a cross sectional view, in which the ~~outsole~~ outer sole is attached ~~into to~~ the cavity of the midsole;

FIG. 30 is a perspective view of the state, in which an elastic bar is formed for reinforcing the ~~throughout~~ through - holes of the midsole;

FIG. 31 is a perspective view of the state, in which an elastic bar is formed for reinforcing the ~~throughout~~ through - holes of the midsole.

FIG. 32 is a cross sectional view showing the state, in which the elastic plate is mounted in the front or the back position of the ~~throughout~~ through - hole in the midsole.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

**[00020]** ~~Hereunder, the most~~ Certain preferred ~~and desirable~~ embodiments of this the present invention ~~will be in detail~~ are described in detail in the following.

**[00021]** As shown in FIG.1, one of the embodiments for the manufacturing method of the invention for forming the ~~throughout~~ through - holes ~~into in~~ in the lateral direction of the midsole is the manufacturing method comprising three steps as described in the following.

**[00022]** ~~First of all, in~~ In the first step, the left surface and right surface corresponding to the outside lateral surface of the midsole 20 are ~~placed at~~ formed in the respective sections of the lower stage ~~molding~~ mold 12 and are molded to ~~be divided in half in separate halves.~~ In the second step, the ~~cut surface two~~ midsole halves are joined at their corresponding inner surfaces 21, ~~which have been formed to be bisected at the above, is attached by the attaching surface.~~ In

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the third step, the ~~outsole~~ outer sole 50 is attached on the ~~lower part~~ undersurface of the assembled midsole sections ~~which is attached and formed~~.

**[00023]**      ~~At this time, the~~ The reason why the left ~~side~~ and right lateral surfaces corresponding to the outer lateral surface are ~~placed~~ molded in the lower part of the lower stage molding mold 12 is ~~that the beauty of shoes looks good to~~ achieve a good appearance and aesthetic result in the final assembled shoe and because the ~~throughout~~ through - holes 22 can be reinforced only when the throughout through - holes exposed outwardly on the left ~~side~~ and right lateral surfaces corresponding to the outer lateral surface should be widened in the case that the ~~throughout~~ through - holes 22 are formed since the ~~higher~~ upper stage molding mold 10 and the middle stage molding mold 11 can be lifted up.

**[00024]**      As a method of glueing the ~~cut~~ surface 21, there is a way of bonding under

~~the~~ pressure by using an adhesive. Also, as a way of attaching the ~~outsole~~ outer sole 50, there is a way of bonding under ~~the~~ pressure by using an adhesive.

**[00025]**      Accordingly, it is possible to form the midsole, in which the ~~throughout~~ through - holes are drilled in a lateral direction, in a conventional molding method, since a form is ~~taken~~ chosen at the ~~state~~ time that the midsole 20, which is to be formed, is ~~elected~~ chosen.

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**[00026]** As a molding configuration for forming the midsole 20 which is divided in half, in a widely known and disclosed molding mold which is constituted with a three stage moldings mold as shown in FIG. 2, the molding mold configuration ~~comprises~~ has a lower stage molding mold 12, in which the ~~throughout~~ through - hole protrusion 15, which is ~~protruding~~ protrudes selectively according to the position and the shape of the ~~throughout~~ through - holes 22 formed the front edge and the back edge of the midsole 20 so as to be inclined toward a side, is fixed in two columns, a middle stage molding mold 11, in which the ~~throughout~~ through - holes 15 that is formed in two columns by forming two ~~sheds~~ compartments 18 divided by a separating partition 13 are inclined toward the separating partition 13 of respective ~~shed~~ compartment 18, and a ~~higher~~ an upper stage molding mold 10, in which the molding protrusion 14 that is inserted through ~~sheds~~ cavities 18 of the middle molding mold 11 so as to be placed in parts, is formed at those locations on the middle mold 12 where the respective ~~throughout there are no corresponding through - hole protrusion protrusions~~ 15 formed on the middle molding 12 is not formed, is formed.

**[00027]** ~~At this time, the~~ The molding protrusion 14 is ~~protruding~~ protrudes in an erect state from a lateral surface of the midsole, in order to form the sole of the foot of the midsole 20, which is formed in a ~~shooting~~ an injection molding method[, in a lateral surface]].

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[00028] ~~At this time, the~~ The pressing surface 17, in which the molding protrusion 14 is not formed in the ~~higher upper stage molding mold~~ 10, is ~~adhering~~ adheres closely to the top surface of the ~~throughout through -~~ holes 15 formed in the lower stage ~~molding mold~~ 12 ~~in the case that when the higher upper~~ stage ~~molding mold~~ 10 is ~~shut up~~ closed.

[00029] Accordingly, in the ~~molding mold~~ configured as this, if forming the midsole 20, the respective midsole 20 is formed at the state that the cut surface 21 is symmetrized so as to be formed and is bisected, as shown in FIG. 1, and then, after the cut surfaces of both sides, is glued each other, the ~~outsole~~ outer sole 50 is attached on a bottom of the midsole 20.

[00030] ~~At this time, since~~ Because the ~~throughout through -~~ holes 22, which ~~is~~ are drilled in a lateral direction of the midsole, ~~is~~ are designed to be widened in an outer lateral surface, the ~~beauty of the shoes looks good~~ aesthetic appearance of the shoes is high and the restoring force of the ~~throughout through -~~ holes 22 can be maintained. Also it is possible not only to increase the cushioning force of the ~~throughout through -~~ holes 22 since the partition 24 formed between the ~~throughout through -~~ holes 22 plays a roll of reinforcing support, but also to provide goods in a variety of design by transforming the ~~throughout through -~~ hole protrusion 15 in the case of forming the ~~throughout through -~~ holes 22.

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**[00031]** Also, in the case that the midsole is not manufactured ~~to be~~  
~~bisected in two parts~~, but ~~to be~~ is integral, the structure of the molding mold, as  
shown in FIG. 3 and FIG. 6, is a structure which lifts up the higher stage molding  
mold 10, as the molding mold is divided into two stages, divides the lower stage  
5 molding mold 12 into the fixed molding mold 40 and the operable molding mold  
41, so that, by making only the operable molding mold 41 ~~pulled off~~ removable  
in the direction of a side, the midsole 20, in which the ~~throughout~~ through - holes 22  
is formed, can be manufactured integrally.

**[00032]** ~~At this time, the throughout~~ The dies for the through - holes 15  
10 mounted on the fixed molding mold 40 and the operational molding mold 41 is  
are designed to be protruding in the lateral direction at the state position that it is  
fixed on the lateral surface, and the ~~throughout~~ dies for the through - holes 15  
formed on the fixed molding mold 40 and the operational molding mold 41 ~~is~~ are  
designed to be geared with each other. At this time, as a method of being geared,  
15 there is a method, in which the front edge of the ~~throughout~~ through - protrusion  
15 comes in contact with each other, and the method, in which the front edge is  
inserted and combined because of the protrusion 15a and the essential input part  
15b.

**[00033]** ~~At this time, the throughout~~ The dies for the through - holes 15 is  
20 are formed on the center of the lateral surface in the case ~~that~~ where it is formed

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on the lateral surface of the fixed ~~molding mold~~ 40 and the operational ~~molding mold~~ 41 and, in the higher stage ~~molding mold~~, the forming protrusion 14 is ~~protruding~~ protrudes on the plane in order to form the sole of the foot in the midsole 20 on its upper surface.

5     **[00034]**       Also, in the case that the ~~throughout~~ dies for the through - holes 15 are formed only on the fixed ~~molding mold~~ 40 of the lower stage ~~molding mold~~ 12, even though there is a difficulty in ~~pulling out~~ ejecting the formed midsole 20, it is possible to pull out easily ~~the baby~~ even small shoes, such as baby shoes, in which the width of the midsole is narrow.

10    **[00035]**       Also, in the case that the operational ~~molding mold~~ 41 is pulled out in the lateral direction, as it goes down due to the weight of the operational ~~molding mold~~ 41 itself, in the case that the ~~moldings~~ molds are required to be ~~combined once again~~ rejoined, in order to prevent the ~~throughout protrusion die~~ for the through - hole 15 from not coming in contact with each other, a guide  
15    support plate 42 is formed in a fixed width on the place where the operational ~~molding mold~~ sinks.

**[00036]**       In the case that the ~~throughout~~ through - holes 22 of the midsole 20, which is formed by the ~~throughout die for the through -~~ hole ~~protrusion~~ 15, is greatly formed, the air ~~bag~~ cushion 23 can be mounted only on the upper surface  
20    of the ~~throughout~~ through - holes 22 in the midsole 20 at the time of forming by

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forming the fixed pin 43 into a side of the ~~throughout~~ through - hole protrusion and inserting to fix the air ~~bag~~ cushion 23 between the fixed pin 43 and the ~~throughout~~ through - hole protrusion 15 so that the air ~~bag~~ cushion 23 may be mounted on the top surface of the ~~throughout~~ through - holes 22 in order to restore  
5 the cushion completely. Also, at this time, instead of the air ~~bag~~ cushion 23, the curved elastic plate 23a can alternatively be mounted.

[00037] Also, the air ~~bag~~ cushion 23 can be mounted on the center of the ~~throughout~~ through - hole, in which it is passed on the front edge, at the time of forming it by fixing air ~~bag~~ cushion 23 in the case that the operational ~~molding~~ mold 41 is shut up, and by placing the air ~~bag~~ cushion 23 on the ~~throughout~~ through - hole protrusion 15c, with the ~~throughout~~ through - holes 15 not being attached closely, on the front edge, in which the ~~throughout~~ die for the through - hole ~~protrusion~~ 15 is formed, in the case that the fixed ~~molding~~ mold and the operational ~~molding~~ mold 41 are ~~shut up~~ closed.

15 [00038] Also as the right and left sides of the middle stage ~~molding~~ mold 11 are widened

11 by three stage ~~molding~~ molds as shown in FIG. 7 and FIG. 8, the coupling line 28 can be designed not to be indicated on the midsole 20.

[00039] For this, a ~~molding~~ mold, in which a coupling line or joint seam 28  
20 ~~cannot be indicated~~ is not desired on the formed midsole 20, wherein the middle



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stage ~~molding mold~~, in which a fixed space is formed so that the molding  
protrusion 14 of higher stage ~~molding mold~~ 10 may be inserted, is divided into the  
left-sided middle stage ~~molding mold~~ 40 and the right-sided middle stage ~~molding~~  
~~mold~~ 41, and is ~~pulled off~~ removed so that it may be widened into the left and the  
5 right directions and the respective ~~throughout~~ through - protrusion 15 is  
protruding in the side direction of the left middle stage ~~molding mold~~ 40 and the  
right middle stage ~~molding mold~~ 41 and, in the case that the left-sided middle  
stage ~~molding mold~~ 40 and the right-sided middle stage ~~molding mold~~ 41, in  
which the respective ~~throughout~~ through - protrusion 15 is formed, are opened and  
10 then shut, so that it may be gathered in the exact position; and in the case that the  
left-sided middle stage ~~molding mold~~ 40 and the right-sided middle stage ~~molding~~  
~~mold~~ 41 are gathered by forming the higher side protrusion 45, in which a  
protrusion jaw 44 is formed on the lower stage ~~molding mold~~ 12, so that it may be  
adhering exactly by the protrusion jaw 44 and the support surface 46 having a  
15 fixed width may be formed in order to maintain the left and the right balance at  
time of adherence.

**[00040]** Also, the midsole manufactured as the above can form the  
~~throughout~~ through - holes so as to have a fixed diameter and shape normally on  
the front edge and the back edge, but, in the case that these the ~~throughout~~ through  
20 - holes are formed, the partition 24, which is made between the ~~throughout~~

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through - holes 22 and the ~~throughout~~ through - holes 22, can have an increased ~~cushion~~ cushioning effect and can maintain a restoring force according to the position of the ~~throughout~~ through - hole and the partition 24 ~~in the case that~~ when a user wears it the shoe and walks in it.

5     **[00041]**       Also, the shape of the ~~throughout~~ through - holes 22 in the midsole 20 which is formed in a shooting method as shown in FIG.10 is slanted in the front direction and formed to be slanted in the back direction, so that it is possible to achieve the increased ~~cushion~~ cushioning effect and restoring force as well.

10    **[00042]**       Also, as shown in FIG. 11, not only it is possible to increase the cushion but also to prevent alien substance from being inserted by allowing a large the ~~throughout~~ through - hole 22 to be formed on the back edge of the midsole 20 so as to form the latticed support 25. Also, as shown in FIG. 12, the cushion can be reinforced by forming a triangle area 25a on the great ~~throughout~~ through - holes 22. Also as shown in FIG. 13, in the case that a vertical support 15   25b is formed on the large ~~throughout~~ through - holes 22, it is possible to make goods having diversified designs, which can increase a restoring force as well as which can increase the cushioning force.

20    **[00043]**       Also as shown in FIG. 14, the width of a through-hole[[, which receives much force, can be increased or the width of a hole, which receives less force, can be decreased by differentiating the width of holes from the ~~throughout~~

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through - holes 20 having the same size on the entire surface of the midsole 20]]

22 increases as pressure is applied to the shoe, compressing the through-hole, and decreases when pressure is removed. Through-holes 22 of various widths can be utilized over different portions of the lateral surfaces of the midsole 20 to

5 differentiate both the appearance and cushioning effect of the holes from soles having uniform sized through-holes. At this time, if If the shape of the ~~throughout~~ through - holes 22 should is to be maintained horizontally on the bottom surface which comes in contact with the ground ~~and it the through-holes~~ should be slanted upwardly on the sole of the foot, it will be good for maintaining the same cushion  
10 and they will also maintain the same cushioning effect. In this case embodiment, the shape of the ~~throughout~~ through - hole is shown as an angled shape, but the ~~angled shape through-holes~~ can alternatively be made as a round shape.

[00044] Also, as shown in FIG. 15, the ~~beauty of the shoes can be graceful~~ aesthetic appearance of the shoes is enhanced by forming the ~~tiny the throughout~~ small through - holes which gather several ~~the throughout~~ through - holes 22 in a fixed appearance and forming these tiny the ~~throughout~~ through - holes 22 into inside of the essential input groove 26 which is grooved in a fixed size and a stopper 27 can be used on this essential input groove 26 as shown in FIG. 16.

[00045] ~~At this time, in~~ In the case ~~that~~ where stoppers 27 are formed, in  
20 order to prevent ~~alien substance~~ foreign substances from being inserted into the

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~~throughout~~ through - holes 22, stoppers 27 can be formed for all the ~~throughout~~  
through - holes 22.

[00046] Also, the ~~throughout~~ through - holes 22, as shown in FIG. 17,  
forms form the back edge in a multi layer as shown in FIG. 17, or the ~~throughout~~  
5 through - holes 22 can be multilayered in order to be placed in a zigzagged ~~form~~  
pattern as shown in FIG. 18.

[00047] By mounting the air ~~bag~~ cushion 23 on the upper side of the  
~~throughout~~ through - holes 22, as shown in FIG. 19, ~~at the time of~~ while walking,  
the restoring force can be increased by the ~~cushion~~ added cushioning effect of the  
10 air ~~bag~~ cushion 23. Also, the elastic plate 23a which is curved as a substitute of  
the air ~~bag~~ cushion 23 can be mounted as shown in FIG. 23.

[00048] Also, the ~~throughout~~ through - holes 22, as shown in FIG. 21, can  
be used by passing through the entire parts of the front edge and the back edge.  
The ~~fine~~ thin erect protrusions 29 can be formed on the ~~throughout~~ through - holes  
15 of the front edge as shown in FIG. 22.

[00049] The curved protrusions 29a, which are different in size, can be  
formed as shown in FIG. 23 and FIG. 24. Also, the supporting protrusions 29b can  
be formed as shown in FIG. 25 In the above the ~~throughout~~ through - holes, a  
filler which has good ~~cushion~~ cushioning capability can be filled and the elastic  
20 tube made in tube type can be inserted for protecting the ~~throughout~~ through - holes.

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**[00050]** Also, as shown in FIG. 26 and FIG. 28, the lower surface of the midsole 20 is cut and a ~~shed~~ cavity 22a is formed. The ~~shed~~ cavity 22a forms the support 22b so that it may be supported. In the case that the support 22b is not formed, as shown in FIG. 29, cushioning force can be increased by glueing the  
5 ~~outsole~~ outer sole 50 and the supporting structure 23b can be formed inside of the ~~throughout~~ through - hole 22, in which a shed 22a is formed.

**[00051]** Also, as shown in FIG. 30 and FIG. 32, by placing the elastic plate 31 or the elastic bar 30 in the front or the back of the ~~throughout~~ through - hole 22, the elastic force of the ~~throughout~~ through - hole 22 will be protected.

10 **[00052]** Also, in order to form the ~~throughout~~ through - hole on the midsole, the ~~throughout~~ through - holes can be formed by inserting and glueing a shed which is formed in the midsole.

**[00053]** Accordingly, it will be an effect that cushions can be increased by the elastic force of the ~~throughout~~ through - hole due to the ~~throughout~~ through -  
15 hole, which is passed through the lateral direction of the midsole. Another effect is that the partition is endowed with the restoring force by cushion because of the ~~throughout~~ through - holes which are holes. Another further effect will be not only increasing the cushion because of the ~~throughout~~ through - holes, but also preventing a foot from being cold because the foot is separated from the ground  
20 because of the reinforcing support and the ~~throughout~~ through - holes even in the

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case that a user stands on the ice or snow at the state that he wears the shoes. still, another effect will be that a user can use shoes which give him a refreshing feeling because the shoes can be separated from the hot ground due to radiant heat during a summer season.

5     **[00054]**       Finally, if the ~~throughout~~ through - holes which are passed through the lateral direction of the midsole are formed according to this invention, it is possible to increase the ~~cushion~~ cushioning effect of, and to reduce the weight of the shoes. Also, it is possible to manufacture ~~them~~ the shoes easily because of the improvement of the manufacturing step and the development of molding molds for forming these the ~~throughout~~ through - holes. Also, due to the improvement of the manufacturing step and the development of molding molds for making these the ~~throughout~~ through - holes, the ~~outsole~~ outer sole for a variety of sports shoes can be provided.

10

**[00055]**       It will be apparent to those skilled in the art that various

15   modifications can be made in the ~~[title]~~ outer soles of the present invention, without departing from the spirit of the invention. Thus, it is intended that the present invention covers such modifications as well as variations thereof, within the scope of the appended claims and their equivalents.